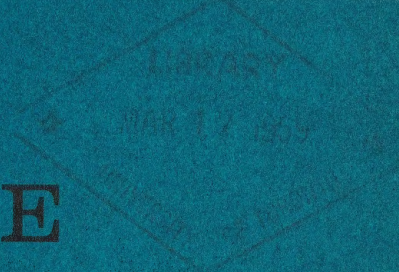


CA1  
PW  
-59F22

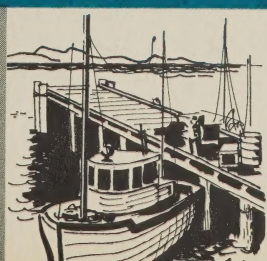
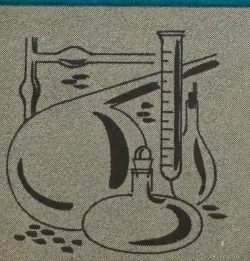



Geo. Doe  
Can  
In



# THE FEDERAL DEPARTMENT OF

# PUBLIC WORKS





Digitized by the Internet Archive  
in 2023 with funding from  
University of Toronto



## CANADA'S DEPARTMENT OF PUBLIC WORKS

•

This is the story of Public Works, a department which in the minds of many citizens has a practical and ponderous significance, associated chiefly with life's unlovely necessities, like plumbing and gas mains.

But perhaps, when we examine more closely and dig deeper into the facts, some unexpected treasures may be discovered and another viewpoint quite boldly suggested. The Department of Public Works is one of infinite variety, with a range of activity that stretches from coast to coast. The solid deck of the international or interprovincial bridge beneath your tires was probably erected by the Department of Public Works. The tiny fishing wharf you stopped to photograph in Nova Scotia, the breakwater reaching across a lake port entrance, the harbour work on Great Slave Lake and the powerful dredge busily scooping mud out of some lonely river—these are all equally the concern of the Department of Public Works.

### From Teeming Cities to Arctic Wastes

In Vancouver, a new federal building costing \$10 million, and another of similar size in Winnipeg constructed by the Department will continue for years to come to be fine landmarks in two of our large Canadian cities. At the same time, suitable accommodation for transient Eskimos is being arranged at Cambridge Bay in the ice-bound wastes of the Arctic region. Two thousand miles to the southeast, 113 acres of rocks, pasture and brush known as Tunney's Pasture have been transformed at a cost of more than \$15 million into a landscaped, functional area where nine attractive government buildings are helping to lessen congestion in Ottawa's centre, and contributing a more orderly development to the capital's long-range plans. All these projects, large or small, receive equally painstaking and thorough consideration from the Branch of the Department that is charged with their care.

The building of the Trans-Canada Highway, in which the Federal Government is cooperating with Provincial Governments, is one of the big jobs undertaken by the Department. At the other end of the scale, it was a welder from Public Works who

went up to Parliament Hill in Ottawa one day and mended the broken spectacle-frames on Sir John A. Macdonald's monument.

Public works, in the pioneer days of our land, had to do mainly with roads and bridges, canals, harbours, lighthouses, piers. Some of these activities have been removed, over the years, from the supervision of the Department of Public Works, and placed under other Ministries: many new areas of supervision have since been added. But before Confederation, before the Union of the Canadas, there was no department coordinating all national construction and development: public works in this young and growing country were put into the hands of individual groups of Trustees and Commissioners.

Early Journals of the Provincial Parliaments of Upper and Lower Canada are full of reports submitted by these Commissioners. The Commissioners for Improvement of the River Saint Lawrence. The Commissioners for the Survey of the Ottawa River. The Trustees of Kingston and Napanee Macadamized Road. The Commissioners of West Gwillimbury Road and Bridge. Even, forsooth, The Commissioners of The Provincial Steam-Dredge, affectionately referred to as "she" throughout the report by the sole Commissioner remaining of three—"one being attainted of High Treason," his plaintive letter informs the Lieutenant Governor, "and the other being deceased."

### When Horse Power was Horsepower

The difficulties these early builders encountered had in many cases a familiar ring, but there were others that read oddly to modern ears. "The waste," they wrote about the roads, "is in the following propositions: Action of the atmosphere, 20%: Carriage wheels, 35%: Horses feet, 45%." Road construction, in those days, appears to have been largely a matter of horsepower. "A horse can exert the following moving forces at different velocities for six hours per day—

2 miles per hour.... Strong Horse, 169 lbs.

Ordinary horse, 100 lbs.

2½ miles per hour.. Strong horse, 156 lbs.

Ordinary horse, 90 lbs.."

From such carefully calculated tables it was deduced that "a moderately strong horse can draw 25 cwt. on a nearly level road, but upon inclinations exceeding 1 in 40, such a load is beyond his strength for any considerable distance. These



deductions," the Civil Engineer wrote earnestly, "assume the road to be firm and wrought in true inclinations; where the roads are loose and ill-formed, the required force of traction is greatly increased."

But—Civil Engineer? Why (some indignant citizens wanted to know) do we need an Engineer? New-fangled nonsense, they were saying, back in 1839: "I think it necessary to employ an Engineer when and only when his services are required—To employ an Engineer upon the roads would run away with from £150 to £200 per annum of public money, when two-thirds of that amount would be saved by employing a practical man by the day, when you require his services."

Times change, of course, but human nature remains fairly constant. There were the same complaints about lack of money: "I am much disappointed in having, at the close of another year, to draw up an annual Report of this Canal, without being able to announce its completion. The cause is well known to the Board, to have originated in a want of money." There were the usual demands for recompense: "Mr. Hiram Southworth submitted a claim for damages to his cellar, in consequence of the water from the canal drain filling it up." There was the self-appointed critic who complained, with a fine flurry of commas, that the Commissioners spent too much time "eating, drinking, and disputing," and suggested tartly that "if Watson, &c., who have so wantonly buried stones enough in one mile for at least two, are not to be hanged, I hope they will be sent to put them all back again in heaps on the side of the road."

### Contractors and Faithful Subjects

Contractors, too, had their troubles in those days. "We have learned," said an impassioned letter to the Commissioners, "with deep concern, that, in consequence of the financial difficulties which the late Rebellion has entailed upon the Province, a suspension of the works is deemed unavoidable . . . we will be thrown (with our provisions, buildings, horses, implements, &c. on our hands) out of employment and forced to seek, in a foreign country and at a vast distance from where our interests and our affections are centered, the means of supporting our families . . .

"Can this not be avoided?" they pleaded. "Must we resort to the western part of the United States to find a field for our industry, and take along with us those poor but faithful subjects of Our Queen, whose labour is the gold of Canada? . . ."

The Contractors were eloquent and the hearts of the Commissioners were moved. They voted five to one for the issue of promissory notes to cover the further work on the project—a canal, the Contractors had said, (in words not totally unfamiliar to twentieth century ears), “vieing with the world for its magnitude, its splendid workmanship, its unbounded utility . . .”

Many bills about this time were brought forward, though not presented, to “establish a Board of Works, at the seat of Government, for the superintendence and management of the various public works”. In 1839, the Journal of the House of Assembly of Upper Canada contains the following record, “Pursuant to notice, Mr. Robinson, seconded by Mr. Solicitor General, moves that Messieurs Merritt, McKay, Cartwright, and Gamble, be a committee to inquire into the expediency of establishing a Board of Works in this Province, under whose control, management and direction, all public works, now in progress or hereafter undertaken, shall be placed, with power to send for persons and papers, and to report thereon by bill or otherwise. Which was carried and ordered.” In 1841, after the Union of the Canadas, a Board of Works was finally set up, with jurisdiction over canals, works on navigable rivers, harbours, light-houses, beacons and buoys, slides and booms, roads and bridges, public buildings and the provincial vessels, and the first Commissioners were the Hon. H. H. Killaly, Chairman; Hon. D. Daly: Hon. S. B. Harrison: and J. Davidson, Esq.

### **Last Board of Works Report**

Between 1841 and the date of Confederation, in 1867, the Board of Works continued to expand its functions, though still regarding canals as its most important projects. Reports on railways began to appear, and there were increasing, though still cursory, references throughout the Commissioners’ reports to buildings—penitentiaries, hospitals, custom houses, legislative buildings, schools, and even office buildings. On 30th June, 1867, Mr. J. Charles Chapais, the last Commissioner of Public Works before it became a Department, drew up a summary of public works “and of the condition in which they will be found on their transfer to the General Government.” His report was to be “the last that will be submitted on the Public Works of the United Provinces of Upper and Lower Canada.” Under Mr. William McDougall, the first Minister of Public Works in the



newly constituted Dominion of Canada, the Department as now set up—though with changing responsibilities and internal reorganization throughout the years—came into existence.

With the enlarging of our economy, of course, other government departments have taken over control of certain aspects of the early Board of Works. Canals and railways, for instance, were placed under the authority of the Department of Transport: hospitals, schools and highways (except in certain categories) became largely provincial projects: penitentiaries went to the Department of Justice: eight of our biggest harbours now fall under the jurisdiction of the National Harbours Board. The flow of operations within the Department divided rather naturally into two main streams, architectural and engineering: first, the provision of buildings to house government services all across the country, and second, the construction and maintenance of certain facilities.

### **Major Reorganization in 1954**

Until 1954, the administrative framework of the Department was based quite simply on these two main divisions. All the work connected with public buildings came under the supervision of the Chief Architect, and all the engineering work was handled by the Chief Engineer. But in the tremendous rush and challenge of Canada's growth and expansion, these two branches had become unwieldy and no longer able to cope with the complex demands and detail work that poured in from all across the land. Consequently, the former Architectural Branch was divided to form the Building Construction Branch and the Property and Building Management Branch, each with its own particular functions and its own administrative staff, and, of course, with a number of subsidiary divisions, sections and units. The former Engineering Branch was also divided into two Branches—the Harbours and Rivers Engineering Branch, whose functions are described by its name, and the Development Engineering Branch, which carries the Department's increasing responsibilities for building other than provincial roads and bridges, and for certain other structures.

The Building Construction Branch, headed by a Chief Architect, carries out its work from a head office in Ottawa, and through the offices of ten District Architects strategically situated across Canada. At headquarters this Branch is subdivided into four divisions: Requirements, Preliminary Design,

Plans and Specifications, and Contracts. In these specialized divisions or units and in the district offices, the architects of the department concentrate on their task of planning, designing and supervising the construction of federal buildings wherever they are required.

### Public Tenders in Open Competition

At the present time, about 175 buildings each year are erected by the Department of Public Works. Some of these are designed entirely by the staff of the Department: for others—usually the larger ones—a private architect or architectural firm is employed. Very often a local architect, knowing specific conditions in relation to the site chosen, the district served and the materials easily obtainable, is better qualified to adapt a building plan to these requirements. The Government is anxious at all times to make use of the best talent available for the individual projects. In these cases, the departmental and local architects work closely together, and in conjunction with officials from any other departments, such as the Post Office, Fisheries, Agriculture, Citizenship and Immigration or National Revenue, in whose interest the building is being erected. The actual construction work is always carried out by contracting firms who have won their contracts by bidding under public tender in open competition.

Members of the staff in the various sub-sections of this Branch are constantly at work on the most exactly measured and inter-locking plans for lighting systems, plumbing and heating, ventilation, elevator service, exterior trim and landscaping. The Department's aim is always to construct a building that will be functional and efficient, durable and comfortable to work in, and still, by reason of its attractive appearance and well-proportioned lines, be an asset to its community by every standard of modern architecture.

People are inclined to think of federal buildings chiefly in terms of post offices, partly because our rapidly-growing communities demand so many of them. But the Department of Public Works erects many other types of buildings for many other government departments—laboratories for agricultural or forestry research, warehouses, ferry terminals, veterans' hospitals, heating plants, schools and R.C.M.P. Detachment buildings and barracks. And some of these buildings house many government



departments besides the one which is the largest, or chief, occupant.

### **5,000,000 Gallons of Fuel Oil**

Once a federal building has been completed, the responsibility of the Building Construction Branch ends. From that point on, it is in the care of the Property and Building Management Branch. This Branch may have been on the scene once before—if the property was not already owned by the Federal government, through its Lands Administration Division it would have acquired the site on which the building has been erected. Now it becomes the landlord. It apportions the space in the building to interested tenants, keeps the building repaired and in order, keeps it clean, heats it and washes its windows, and moves tenants in and out, making alterations to suit. In the 3,500 public buildings across Canada, twenty million square feet of space has to be cleaned: 2,800 stationary engineers, caretakers and firemen feed 120,000 tons of coal and 5,000,000 gallons of fuel oil to government furnaces and boilers each year.

Statistics are sometimes dull but in this area of the Department's program they have a fantastic human interest for every resident of Canada. Imagine the army of over 4,000 cleaners and caretakers that in a year spreads 45 tons of floor wax, replaces 500,000 burnt-out light bulbs, supplies thousands of gallons of soap—and enough paper towelling to stretch from coast to coast. Imagine, in Ottawa alone, the 150,000 windows, skylights and wind deflectors that are scrubbed and polished at least twice yearly at an annual cost of \$90,000—and the furnace room of the Central Heating Plant, whose 360,000 pounds of steam an hour piped underground to most major downtown government offices produces 20 tons of daily ashes! And think of the supplies of furniture and equipment bought and distributed by the Purchasing and Stores Branch in a year—something like 5,000 filing cabinets, 2,000 double pedestal desks, 1,000 single pedestal desks, 1,500 typist desks, 10,000 chairs, 10,000 mops and 12,000 brooms.

### **D.P.W. is Nation's Housekeeper**

People have been known to call this Department the nation's housekeeper. Its housekeeping duties sometimes involve more specialized tasks, such as exterminating the mice and rats at the

Governor General's residence, or cleaning the National War Memorial on Ottawa's Confederation Square and the statues of famous personages on Parliament Hill. Other duties are assigned to the Department that will not readily occur to the minds of many Canadians. The noonday gun that on the stroke of twelve echoes out across the river from Ottawa's Majors' Hill Park is fired by a Public Works employee: the flags that fly on public buildings across the country are raised and lowered by representatives of the Department: and whenever there is a national occasion or ceremony in the nation's capital, workmen from Public Works have been busy behind the scenes erecting platforms, draping bunting, hanging canopies and setting up plaques. It is in these and other ways that the Department of Public Works fulfils a housekeeping role.

The engineering function of the Department, one of its earliest areas of responsibility, is concerned today mainly with marine works and with certain highway developments. The Harbours and Rivers Engineering Branch is required to design and build a variety of harbour and marine structures, such as docks, breakwaters, shore protection works, slipways, graving docks, dams and hydraulic works. Each year about 425 of these projects are under construction or reconstruction: some are carried over from the previous year and some are of a recurring nature. Another 300 are usually in the planning stage. The Department also plans and executes dredging operations in order to keep free for navigation the 4,000-odd harbours across Canada that are not under the National Harbours Board. About 325 dredging projects are carried out each year, of which 60 are let by contract to private firms and the rest performed by departmental employees and dredging equipment. The Department owns and operates at the present time 34 dredges, one drill boat, 24 tugs, two snag boats, nine ancillary launches, 45 scows and sundry other oddly-named vessels such as a dipper and a clamshell. Dredging is done not only along our Atlantic and Pacific coastlines but in the St. Lawrence River, the Great Lakes, Lake Winnipeg and Lake Winnipegosis, on Clearwater River, on Lake Athabaska and the Athabaska River, along the Mackenzie River and at Aklavik on the Mackenzie River delta in the Northwest Territories and in the Fraser River—all names that ring across Canada with the sound of adventure and romance.



## Canada's Largest Drydock

The Harbours and Rivers Engineering Branch also maintains and operates four graving docks, or floating drydocks, with repair facilities: two at Esquimalt in British Columbia and two on the St. Lawrence River at Lauzon, P.Q. One of the Esquimalt drydocks is the largest in Canada and serviced the liner "Queen Mary" upon an occasion during World War II.

This Branch looks after the operation and maintenance of 10 dams, a marine railway at Selkirk, Manitoba, and 17 bridges, and supervises 7,000 other marine structures of various types. In the operation of the dams, the Branch is concerned with the control of water levels, having to satisfy the often contradictory requirements of mill-operators, shipping and navigation generally, lumbermen, tourist resort and lakeshore property owners. It also administers part of the Navigable Waters Protection Act, which requires application to be made for permission to erect structures in, over, under or through a navigable body of water—for instance, bridges, docks, piers, boathouses, pipelines, communication cables or electric power lines.

The second Branch created at the time of the departmental reorganisation in 1954 is the Development Engineering Branch. The task of this branch is to look after the Department's increasing responsibilities for building roads and bridges, and to operate a Testing Laboratory. Its biggest project at the present time is the Federal Government's share in the construction of the Trans-Canada Highway which includes supervision and inspection of work in close liaison with the provincial highway departments, to see that the specifications are met and to check and approve claims for payments under the Trans-Canada Highway Act. Under an agreement embodied in the amended Act of 1956, the Federal Government is to pay 90% of the cost of building 10% of the mileage in each province, and 50% of the remainder up to a total of \$250 million.

The Trans-Canada Highway Act is bringing into existence a concept that has long been in the minds of all thoughtful Canadians—a road nearly 5000 miles long on which it will be possible to drive wholly within Canada from St. John's, Newfoundland, to Victoria, British Columbia, on a wide, paved highway with safe sight distances and every necessary technical development known to the science of roadmaking. In this task, and through the agency of the Department of Public

Works, the Federal Government is sharing with the Provinces the responsibility and the expense.

### Highway is Huge Undertaking

The story of the Trans-Canada Highway is a saga in itself, one of Canada's most exciting undertakings, full of adventure and challenge (see *Canadian Geographical Journal*, February 1957 issue). Constructed by joint agreement between Federal and Provincial Governments and financed by both, it will be more than an economic asset to Canada. Besides its function as a physical means of communication between here and there, it will have another, more abstract function—that of union. It is one more project in which all Canadians share: they have a common interest in its construction and a common benefit from its completion. By its very existence it will be an important factor in our standard of living from coast to coast, and in the development of our national character. It will unite us more closely as a people.

The Development Engineering Branch is also directly responsible for constructing on behalf of the Department of Northern Affairs and National Resources all major roads in the National Parks and in the Yukon and the Northwest Territories. The Structures Division is concerned with bridge designing and construction. Bridges in the National Parks and other bridges financed or partly financed by the Federal Government are designed by the Structures Division, and sometimes the actual construction is under the direct supervision of departmental engineers. The Department is responsible for Canada's participation in building publicly-owned bridges between Canada and the United States, such as the recently completed link between St. Stephen, New Brunswick, and Calais, Maine: bridges between two provinces, such as the central section of the Pembroke-Allumette Bridge Project linking Ontario and Quebec: and it has also designed and supervised the construction of several other bridges developing the national capital at Ottawa. Bridges along the Trans-Canada Highway, except in the National Parks, are the responsibility of the province concerned, but Public Works engineers must approve the design.

### Variety of Materials Tested

Another interesting aspect of the Department's activities also comes under this Branch: the Testing Laboratories. They



supply a materials-testing service for all government departments and agencies, where anything from building-concrete to ball-point pens can be tested to see which type proves most efficient and economical. Floor waxes, polishes, paints, soaps, detergents, papers, inks, floor tiles and table tops are all tested here to ensure that public servants and buildings are provided with the best possible materials and equipment and that the department's maintenance operations are up to the best modern standards. Two useful and specialized subdivisions of the laboratories are the Test Borings Section and the Soils Section, which analyse soil samples for foundation and grading requirements and for possible chemical effects on construction materials and methods.

On the administrative side, a recent development very much in tune with modern conditions has been the introduction of an Economic Studies Branch. While in earlier years engineers and architects of the Department have always tried to measure the importance of any project against its overall value to the immediate community and to the country as a whole, Canada's growth has been on such a vast scale that expert professional help has become necessary to assess the true economic effects of public works investments and maintenance outlays as distinct from their engineering or architectural aspects. In making their analyses and recommendations, the economists draw upon data supplied by district engineers and architects, and by other federal government departments, provincial and municipal governments, private industry, trade associations and other sources. They will, for instance, look at the proposal for a new fishing or industrial wharf in the light of its ability to stimulate other industry and development in its community. Where a new town or village has sprung up, they will study its prospects of expansion to assess the size and type of federal buildings it will need and can support. In cooperation with the Development Engineering Branch, the economics group can advise the highway engineers on the selection of route in relation to future population and resources in the area, or suggest that a bridge here rather than there will give better and longer-lasting service to the public generally.

The economists make on-the-spot surveys of particular areas where federal investment is being considered. For instance, in the summers of 1956 and 1957 members of the economics staff engaged in field work in the Maritimes along

with headquarters and district engineers and sometimes with representatives of the federal Department of Fisheries. These on-site assessments by the economics group are now an established part of its yearly operations.

Because of the number and variety of works projects handled by the Department, and because the Department is responsible for the management of existing buildings and other Government properties, many requests for information are received. It is the function of the Information Services Division to handle these requests. The issuing of such information through a single unit prevents duplication of effort, and ensures that releases are made in accordance with established Departmental policy.

The Division issues at regular intervals summaries of contract awards for the use of trade publications and daily and weekly newspapers. The Division also maintains a file of perspectives of building projects as well as photographic records of construction progress for Departmental use and for publication as required. In addition to handling direct inquiries from the public, the Division also supplies photographic and textual material for writers, editors and radio and television services.

### **Interesting Variety of Functions**

These are the main continuing activities of the Department of Public Works. It performs a multitude of tasks without which the Federal Government could not very well function. Some of these, while interesting, are in the nature of routine assignments. But some of the special jobs in which the Department is involved from time to time are unusual and picturesque, with a romantic aspect that should stir the imagination of every Canadian. The plan to remove the hazardous twin peaks of Ripple Rock is one of these: the fascinating pre-blast story of this project appeared in the March 1957 issue of Canadian Geographical Journal. Another is the relocation of Aklavik.

In this project—the building of a new community in the farthest northern reaches of our country—the Department of Public Works is carrying out assignments for several other government departments, notably that of Northern Affairs and National Resources, which has the overall responsibility for administration in the Northwest Territories. The old settlement of Aklavik was located on the west channel of the low-lying



delta area of the Mackenzie River, almost on the shores of the Arctic Ocean. Under conditions of modern development, it has become an important centre of distribution and transportation, and expansion was a vital necessity. Certain physical factors limited this expansion at the present location, notably the lack of a suitable site for an airstrip and the problem of sanitation. No natural drainage existed at the old site, and conditions of erosion and permafrost created obstacles to the installation of sewers. Accordingly, survey teams were sent out to find a better site, one that fulfilled these essential requirements.

The new site, chosen on the east channel of the river, filled all of the essential requirements and most of the desirable ones. Many problems peculiar to building and engineering construction under Arctic conditions still remained, but these have been largely overcome by imagination and ingenuity. The new area, now named Inuvik (Place of Man), has been cleared of brush and road construction begun. A new public wharf has been completed, storage tanks constructed, and schools, hostels and other essential buildings have been or are being constructed on a foundation of piles, set deep in the permafrost in holes bored by steam jet. Through the next few years, taking every advantage of the short summer season and planning for the maximum use of what can be done in the winters, the work of building the new town will go on, and many millions of dollars will be spent on the program.

### **Important Northern Development**

The Aklavik venture is the most spectacular but not the only contact of the Department of Public Works with Canada's northland. Increasingly large participation in construction projects in this area has included roads, bridges, wharves, some dredging, construction of public buildings and homes for federal employees. It also includes extensive projects for other departments—for example, a National Health and Welfare hospital at Whitehorse costing almost \$4 million, and a \$1 $\frac{3}{4}$  million hostel, school and administration building development at Fort Smith for Northern Affairs and National Resources. The construction work done for Northern Affairs includes such varied items as a laundry and bath houses, a well with pipeline and pressure system, a sewage disposal system, office and apartment buildings, and a vocational training school.

What sort of people man the Department of Public Works? Such a diversity of chores requires a staff of many and varied abilities. Engineers, architects, economists and lawyers: electricians, greenhouse men and dam keepers: navigators and surveyors: seamen, cooks, stenographers, clerks, stone-cutters, carpenters, upholsterers: almost, you might say, butchers and bakers and candlestick-makers. Nine thousand of them, not a man too many for the size of the job which has been done and is destined to increase. With this comparatively small staff scattered from coast to coast, and in this field of federal responsibility—from constructing and controlling dams and the flow and level of water in lakes and rivers, to commissioning, erecting or merely cleaning the national monuments and memorials in Ottawa, from blueprints to pick-and-shovel work, from the Minister to the most junior clerk, every energy and every employee of the Department of Public Works is directed towards the concept of service, to the extension of frontiers in four dimensions: length and breadth and depth—and time. For the Department serves both the present and the future.





THE QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1959

Cat. No. W31-1259





